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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,155	02/26/2002	Masaaki Katoh	259052002900	2654

7590 10/29/2003

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EXAMINER

HU, SHOUXIANG

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 10/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/086,155

Applicant(s)

KATOH, MASA AKI

Examiner

Shouxiang Hu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Claim 11 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

Drawings

2. Figures 7-9 are objected to as they should be designated by a legend such as -- Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 1-10 and 12-27 are objected to because of the following informalities:
4. In claim 1, the term of "PN junction surface" should read as: --PN junction interface--.
5. Claim 7 fails to clarify whether the recited dielectric thin film is definitely comprised in the claimed structure.

6. In claims 8, 14-17 and 19, the term of "the Ni vapor-deposition film" lacks sufficient antecedence basis in the claims. Special attention is needed for claim 19, as claim 7 already cites Au as the metal thin film.

7. Claims 2, 10 and 20-27 each recite the term of "substrate," but each fail to clarify which of the two substrates recited in claim 1 is referred to.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-6, 8, 10, 12-18, 20-24 and 26, as being best understood in view of the claim rejections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu et al. ("Chu"; US 2002/0117672 A1) in view of Okazaki (US 5,670,797; of record).

Chu discloses a light-emitting diode (LED) comprising a LED chip (Figs. 1-6), including: a substrate (10-1, 201 or 501); a semiconductor layer (102-103, 202-204, 502-504) laminated on the substrate and formed of an N-type semiconductor layer and a P-type semiconductor layer, wherein a portion in the vicinity of the PN junction interface is rendered to be a light-emitting portion; a light reflecting layer (205, Ni or Au, having a thickness range covering 100 nm; or 209, a DBR) for reflecting light emitted from the light-emitting portion; and a pair of electrodes (104-105, 206-207, or 506-507).

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Although Chu does not expressly disclose that the LED chip can be vertically mounted on a printed substrate with its PN junction interface being perpendicular to the surface of the printed substrate, Okazaki teaches that such a vertically mounted LED chip is desirable for high reliability and easy mass production (see the vertical LED chip 44 in Fig. 8 (b); also see the abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the vertical LED mounting structure of Okazaki into the LED of Chu, so that a LED with high reliability and easy for mass-production would be obtained.

10. Claims 7, 9, 19, 25 and 27, as being best understood in view of the claim rejections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu in view of Okazaki, as applied to claims 1-6, 8, 10, 12-18, 20-24 and 26 above, and further in view of Morita et al. ("Morita"; US 6,121,636).

The disclosure of Chu and Okazaki are disclosed as applied to claims 1-6, 8, 10, 12-18, 20-24 and 26 above.

Although Chu and Okazaki do not expressly disclose that a dielectric thin film can be formed between the substrate and the metal thin film, it is art known that a thin SiO₂ film can be desirably formed between the substrate and the metal thin film for smoothing the interface therebetween, as evidenced in Murita (see col. 5, lines 14-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the smoothing dielectric thin film of Morita

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into the LED collectively taught by Chu and Okazaki, so that a LED with smooth reflective metal thin film would be obtained.

Regarding claims 9 and 27, Chu further teaches that the Au film can have a thickness range covering the recited thickness of the instant invention. And, it is noted that the recited thickness for the smoothing dielectric thin film is well within or overlap with the art-recognized normal thickness for a smoothing dielectric thin film; and that the exact thickness of a smoothing dielectric thin film is an art-recognized parameter of importance subject to routine experimentation and optimization.

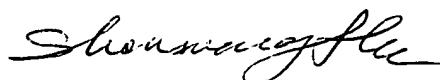
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is (703) 306-5729. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SH
October 20, 2003



**SHOUXIANG HU
PRIMARY EXAMINER**